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Research Article

Health - promoting components of phytochemicals found in selected medicinal plants on the Loyola degree college campus (YSRR) Pulivendula-YSR Kadapa

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Abstract

Phytochemicals are produced by plants as a defence against diseases. They are used to treat a variety of neurological, immunological, and metabolic abnormalities in people in conventional treatments. Indigenous plants are increasingly being used in commercial medicine as a result of rising population. Demand increased as a result of the antioxidant, anti-inflammatory, and antibacterial characteristics of plant extracts. Plant tissue culture, on the other hand, has established itself as a reliable technique for obtaining bioactive substances from plants. Artificial plant culture can boost the production of phytochemicals in medicinal plants. Plants contain chemical substances called phytochemicals, which have positive effects on human health. Typically, a variety of plant metabolic processes result in the production of phytochemicals. Phytochemicals include, among others, polyphenols, flavonoids, isoflavonoids, anthocyanidins, phytoestrogens, terpenoids, carotenoids, limonoids, phytosterols, glucosinolates, and fibres. Consequently, phytochemicals may play a role as preventative agents against a number of chronic diseases in addition to being employed to promote overall health.

Keywords: Medicinal plants, Phytochemicals, Health promoting components.

INTRODUCTION

Nature has given us a complete supply of cures for every human disease. An essential part of the healthcare system is the use of plants as a source of medicine, which has been practiced since the dawn of human civilization. The Sumerian culture, which lived around 3000 BC, left the earliest written records of herbs and therapeutic plants. On clay tablets, they listed hundreds of plants, including opium. Over 850 plant medicines are mentioned in the 1550 BC Ebers Papyrus from ancient Egypt. In the book of De materia medica, published in around 60 AD by the Greek physician Discords when he was serving in the Roman army, he recorded over 1000 drug formulations made from over 600 different medicinal plants.

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Herbology or "*herbal medicine*" is the term used to describe a variety of plants used in herbalism (Ahn, 2017). It involves the use of plants as medicine and the research into how they are used for things like food, medicine, scent, and even certain spiritual practices. Today, the term "*herb*" is used to describe any component of the plant, including the fruit, seed, stem, bark, flower, leaf, stigma, or root of a non-woody plant. Ethnobotany is sometimes used in drug research to look for pharmacologically active molecules, and this method has produced thousands of beneficial bioactive compounds. Although there are many different types of molecules in plants, the majority belong to one of the four major biochemical classes: alkaloids, glycosides, polyphenols, and terpenes. Aspirin, digoxin, quinine, and opium are some examples of common medications in this group. According to studies, there is evidence that European and Mediterranean cultures, Indian Vaids, Unani Hakims, and others have used plants as medicine for more than 4000 years. Herbs were used in healing rituals by indigenous societies in Rome, Egypt, Iran, Africa, and America, while other cultures created traditional medical systems like Ayurveda, Chinese Medicine, and Unani that systematically employed herbal remedies.

The current study concentrated on the various varieties of medicinal plants that can be found on the Loyola Degree College (YSRR) campus and specifically identified plant collections to evaluate their phytochemicals for the conventional treatment of humans and analyse to the available falvonoids and bioactive components in those plants. In general, because the Loyola Degree College is located in a highly hilly area, they have to exhibit a wide variety of plant diversity on the college campus. On the campus, close to 7000 plants are grown. On the Loyola Degree College Campus in Pulivendula, 250 different plant species, as well as 50 different medicinal plant species, were found, (Jhaumeer et al., 2018).

MATERIAL AND METHODS

Collection of Plant materials

The medicinal garden (*Sundhara vanam*) of Loyola Degree College, Pulivendula, YSR Kadapa, situated in the Ryalaseema belt of Andhra Pradesh, was the source of the leaf or plant samples of *Tinospora cordifolia, Vinca rosea, Abutilon indicum, Phyllanthus emblica, Nerium odorum, Phyllanthus aspera,* and *Acalypha indica* **(Figure 1)**. With the aid of various floras, the selected plant species have been precisely identified.

Preparation of Extraction

In a conical flask filled with 100 ml of methanol and plugged with cotton wool, 10 g of air-dried powder was added. The mixture was then shaken continuously for 24 hours at 190–220 rpm. Following the 24-hour period, the supernatant was collected, the solvent was evaporated to reduce the final volume to one-fourth of the initial volume (12), and it was then stored at 4 °C in airtight bottles.

The leaves of a few different plant species were carefully isolated, cleaned, dried in the shade, mechanically ground, and then powdered coarsely. A conical flask filled with 100 ml of methanol and 10 g of air-dried powder was added. The flask was then sealed with cotton wool and placed on a rotary shaker set to 190–220 rpm for 24 hours. The supernatant was collected after 24 hours and the solvent was evaporated to reduce the final volume to one-fourth of the initial volume (12). The supernatant was then stored at 4 °C in airtight bottles (Parekh & Chanda, 2007). The leaf powders were then extracted using a Soxhlet method with 90% methanol, and the resulting extracts were used in a variety of chemical colour reaction tests to identify various phytochemical groups.

The major natural chemical groups such as starch, alkaloids, flavonoids, tannins, reducing sugars, amino acids, and lignins

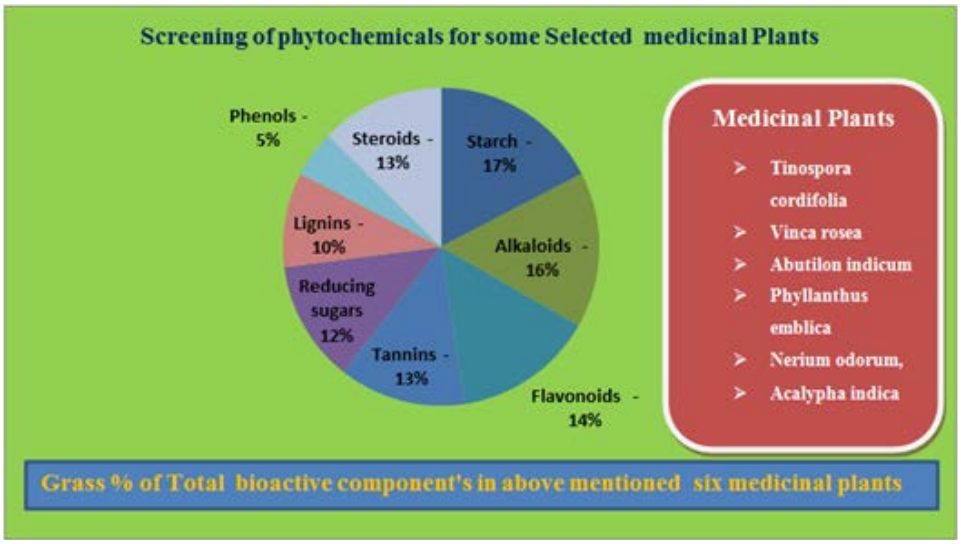


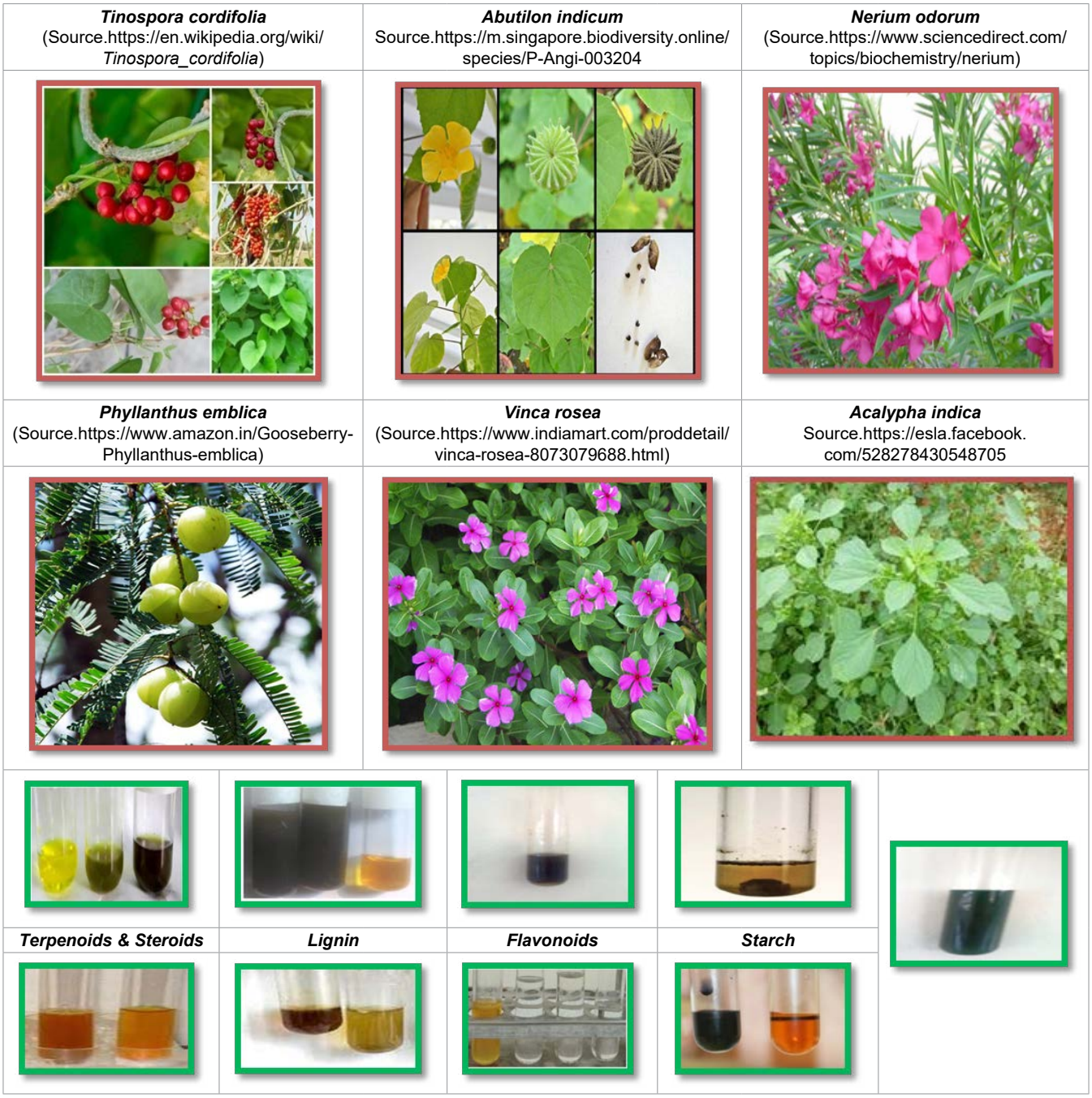
Figure 1. The graph showing various bioactive components present in selected medicinal plants. Photographs of investigated medicinal plants.

were identified through phytochemical screening, which evaluated the qualitative chemical composition of crude extracts using commonly used precipitation and coloration reactions. These analyses' general reactions showed whether these compounds were present or not in the tested crude extract (Nag et al., 2013; Sivagnanam et al., 2012).

RESULTS

Tinospora cordifolia, Vinca rosea, Abutilon indicum, Phyllanthus emblica, Nerium odorum, and *Acalypha indica* were the plants with the highest concentration of phytoconstituents, including starch, alkaloids, flavonoids, tannins, reducing sugars, amino acids, tannins, phenols, steroids, and lignins, according to a preliminary phytochemical analysis of their methanolic extract **(Table 1)**. **Figure 2** depicts the chemical colour reaction tests for the chemical components of the leaf extracts of the plants under investigation. Starch, alkaloids, amino acids, and lignins

Figure 2. Chemical color reaction tests of whole plants extractions in selected medicinal Plants.



have all been positively impacted by methanolic extracts of the entire plant of the six plants mentioned above. However, only a small number of bioactive components exhibit weak extraction rates. This study aims to assess various phytochemicals in particular medicinal plants. All bioactive substances, including alkaloids, flavonoids, resins, tannins, reduced sugars, amino acids, terpenoids, starch, and steroids, can be found in Abutilon indicum in significant amounts. The tannin content of methanolic extracts is not present in Vinca rosea. **(Table 1)**. Regardless of the circumstance, our experiment revealed that a qualitative analysis of conventional chemical tests reveals the coloration for it to produce meaningful results.

DISCUSSION

Medicinal properties of selected plant species:

Tinospora cordifolia (https://en.wikipedia.org/wiki/Tinospora_cordifolia) **is significant in conventional ayurvedic medicine and has been used for centuries to treat conditions such as fever, jaundice, chronic diarrhoea, cancer, dysentery, bone fracture, pain, asthma, skin disease, poisonous insect bites, and eye disorders (**Bansal & Priyadarsini, 2021; **Parthipan et al., 2011;** Kaur et al, 2016)**.**

Vinca rosea (https://www.indiamart.com/proddetail/vinca-rosea-8073079688.html) drugs are naturally derived from Catharanthus roseus G. Don, the pink periwinkle plant, and have both cytotoxic and hypoglycemic effects. In addition to being used as disinfectants, they have been used to treat diabetes and high blood pressure. The *Vinca alkaloids* are essential as anti-cancer agents **(**Jayaraj et al., 2019; Moudi et al., 2013).

Phyllanthus emblica: The fruit of this plant, which has been used in Ayurveda as a potent rasayana and in traditional medicine to treat diarrhoea, jaundice, and inflammation, is the most medicinally useful part of the plant. The anti-diabetic, hypolipidemic, antibacterial, antioxidant, antiulcerogenic, hepatoprotective, gastroprotective, and chemopreventive qualities of various plant parts are demonstrated. Here, we go over its linguistic, morphological, pharmacological, and historical aspects (Mirunalini & Krishnaveni, 2010).

Abutilon Indicum (Linn.) Gout, tuberculosis, ulcers, bleed disorders, and worms can all benefit from it. It has numerous medicinal uses, including those for digestion, laxation, expectoration, diuretics, astringents, analgesics, anti-inflammatory agents, anthelmintics, demulcents, and aphrodisiacs. Decoction for sore gums and toothaches. Leaf demulcents are applied locally to boils and ulcers. Roots are recommended in cases of fever, chest pain, and urethritis. Root and bark are traditionally used as diuretics, aphrodisiacs, and anti-diabetics. Urinary disorders can be treated with seeds. The seeds are used to treat coughs and as a laxative in piles (Rajeshwari, et al., 2018; Sohel, 2015**).**

Nerium odorum: The seeds and leaves of this plant are used to make medicine despite the danger it poses to both humans and animals. In addition to being used to induce abortions, (https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-iology/nerium) is also used to treat heart conditions, asthma, epilepsy, cancer, painful menstrual cycles, leprosy, malaria, ringworm, indigestion, and venereal diseases. Not Enough Data to Rate Effectiveness for Heart Issues. seizures and asthma. Cancer, painful periods, when applied to the skin, as a poison and for skin conditions.

Acalypha indica has the ability to act as an anthelmintic, anti-inflammation, anti-bacterial, anti-cancer, anti-diabetes, anti-hyperlipidemic, anti-obesity, anti-venom, hepatoprotective, hypoxia, and wound healing (Zahidin et al., 2017).

CONCLUSION

According to the current research, the methanolic extract of six different medicinal plants can produce the best consequences.

Further research is needed in this area, though, to conduct a thorough analysis that includes qualitative or semi-qualitative analysis, characterise the chemical structure, and judge the biological activities. The six plants listed above are clearly very beneficial. Some common and other different diseases may be treated with the help of these plants. For these plants to be used effectively, it is necessary to explore their full potential in the pharmaceutical and medical fields.

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